Effect of Climate on Flowers crop Production

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Introduction: -

There are two important numbers to understand regarding Climate change. The first number is Fifty-five billion, and the second is Zero. Fifty-one billion represents the amount of greenhouse gases that are typically added to the atmosphere each year. Climate change and agriculture are closely connected on a global scale. Farming is impacted by climate change in various ways, including changes in temperature, rainfall, extreme weather events, pests and diseases, carbon dioxide levels, ozone concentrations, nutritional quality of food, and sea level. The effects of climate change on agriculture are already being observed, but they are not evenly distributed worldwide. Vulnerable groups, such as the poor, are at a higher risk of food insecurity due to climate change. For instance, South America may lose 1-21% of its arable land, Africa 1-18%, Europe 11-17%, and India 20-40%. Climate change is caused by the increased levels of greenhouse gases (such as CO2, Methane, and nitrous oxide) in the atmosphere, resulting in higher atmospheric temperatures.

Effect of Climate Change

Climate change has both direct and indirect impacts on agricultural activity, which includes crops, soils, livestock, and pests. On a direct level, rising temperatures result in shorter crop durations, higher rates of crop respiration, changes to the photosynthesis process, shifts in pest populations' distribution and survival, accelerated nutrient mineralization in soils, reduced efficiency of fertilizer use, and increased evapo-transpiration. Indirectly, climate change influences the pattern of agricultural land use, the severity of droughts and floods, transformations in soil organic matter, soil erosion, alterations in the pest population, and a decline in arable land availability.

General Impact of Climate change on Flowers Production: -

weather change affect some flora fail to bloom, others will produce flowers of smaller length, mistaken coloration development and shorter blooming duration. The production of flower vegetation grown on open subject conditions like marigold, gladiolus, tuberose, rose, annuals will be tormented by weather trade. different ornamentals along with orchids, balsam which needs frost and low temperature for flowering are adversely stimulated. The better ambient temperature will have direct effect on risky fragrances that the vegetation emit, deterioration of pigments main to stupid sunglasses, shift in insect pest and disease outbreaks, absence of iciness chilling will lessen flowering, reduced put up-harvest lifestyles, negative pollination and seed set. changing pattern in photo periodism and thermo-periodism would greatly alter the flowering pattern in plants together with chrysanthemum, poinsettia and carnation. due to direct effect small scale gamers who rely upon rain-fed floriculture will be extraordinarily susceptible to climate change.

Impact of climate change on Orchid Biodiversity: -

Orchids are perennial herbs; The common belief is that the orchid is only found in dark damp places in the jungle. That is not true at all. They are found in all parts of the world from the sandy desert of Australia and Africa. Climate change due to global warming is associated with habitat loss and fragmentation, introduced and invasive species, and population growth, and many ecosystems are likely to undergo major changes. In tropical countries, environmental changes have been reported to affect biodiversity in conjunction with increased industrial development, and as a result, semiarid plants will replace arid plants. Increased temperature can cause tropical species to move into subtropical zones, subtropical species to temperate zones, and species at the highest elevations to become extinct. Epiphytic orchids can be affected in various ways by changes in the availability of light, nutrients and moisture. Climate change is a major threat to pollination services and the plant communities in which orchids live need to be preserved. The combination of higher temperatures and lower rainfall can make forests more prone to fire and lead to the extinction of native species. At the World Orchid Conference held in Miami in 1984,

The proposal to store orchid seeds was taken as an insurance policy against the genetic erosion of species from their natural environment. Most orchid species can be stored dry at -20°C. Liquid nitrogen can be used to further extend the life of orchid seeds. Emphasis should be placed on live collections for

For this purpose, conservation management and a larger number of members of the orchid community must be involved.

Physiology effect of CO_2 Enrichment: -

In protected culture, increasing the CO2 level to 900 ppm removes the O2 inhibition of photosynthesis due to the increased CO2 / O2 ratio. Increasing CO2 concentration reduces plant transpiration by 20-40%. In general, the ratio of polyamine to ethylene is higher in young stages and lower in older ages, and stress conditions such as salinity can accelerate the balance change from youth to old age. High CO2 can reverse the change by promoting polyamine synthesis. CO2 enrichment increases stomatal resistance in C4 plants more than C3 plants.

Morphological changes at elevated CO_2: -

Leaf growth: The CO_2 enrichment increases the amount of leaves /plant in Saintpaulea, Nephrolepis and gerbera. Total leaf weight increases due to one or two extra palisade cell layers and more densely packed palisade mesophyll cells.

Stem growth: Plants subjected to elevated CO_2 are in general heavier because dry weight /unit stem length in greater.

Root formation: Elevated levels of CO_2 applied in the form of carbonated mist increases the per cent of rooting and number of roots/ cuttings in Chrysanthemum, Juniperus and Rhododendron due to increased effects of Carbohydrates.

Branching and tillering: An increased number of lateral shoots caused by CO_2 enrichment has been observed in roses, carnation and gypsophila due to lowering of apical dominance at elevated CO_2.

Flowering: At an elevated CO_2, flowering of short-day plants is prevented for some plants. Total number of flowers in carnation is increased due to increased lateral branching. Formation of basal shoots by higher CO_2 concentration leads to renewal of rose bushes and due to weakening of apical dominance.

Advantage of Co_2 enrichment: -

- Increases photosynthesis and brings a dramatic increase in nitrogen-fixing capacity in legumes.
- Increases the rate of photosynthesis in most plant species by producing more sugars per unit of absorbed light.
- Increase in vegetative growth (shoots, leaves, stem, roots) by an average of 13% and their reproductive performance (flower and seeds) by an average of 31% and grain yield by 34%.

Effect of CO_2 enrichment on growth and flowering of greenhouse ornamentals-

Crop	CO_2 concentration	Effects
Begonia	700-900 ppm	Enhanced growth rate, shorter culture time, larger flowers and abundant flowers
Hibiscus	1000-1500 ppm	Earlier and a greater number of flowers
Chrysanthemum	700-900 ppm	Higher relative growth rate, shorter culture time, better flower quality
Rose	1000-1500ppm	Reduced number of blind shoots, higher yield, longer and stronger glower stems
Tulip	1000-1500ppm	No beneficial effect
Carnation	1000-1500ppm	Better lateral branching, higher growth rate of young plants, higher yield and better stem quality
Petunia	1000-1500ppm	Earlier flowering
Dieffenbachia	700-900 ppm	Faster growth
Ficus elastica	1000-1500ppm	Larger leaves

Challenges: -

Biodiversity and Conservation: -

- Implementation of community-based projects in the field of biodiversity conservation provides an opportunity for active participation and participation of local and indigenous people.
- More biosphere reserves, protected areas and genetic resource banks should be established.
- Conservation and sustainable use of plant diversity and promotion of education and awareness about biodiversity conservation at the local level is encouraged.
- Conservation genetics, mycorrhizal communities, pollinator interactions, in situ conservation (biosphere reserves, national parks, sacred ditches, gene stocks, single trees) and in situ conservation (field gene banks, botanical gardens, We will address comprehensive approaches to orchid conservation including medicinal plants (gardens), in vitro conservation, cryopreservation, and DNA banking).

Genetic Improvement: -

- Genus and species cataloging of all germplasm collections using IPGRI descriptors.
- In view of IPR regulations, it is of utmost importance to protect our germplasm using modern barcode tools
- Building a strong crop improvement program based on reliable breeding methodologies that will lead to the development of hybrids/varieties with internationally acceptable quality traits
- Evaluation of newly developed genotypes to suit specific agro-ecological conditions.
- Locating sources of resistance to biotic and abiotic stresses using conventional and biotechnological tools and developing varieties with high yield, quality and specific traits.

Frontier Science Technologies: -

- The use of existing hybrids and population isolation is necessary to create a linkage map. Therefore, the facilities at IIHR, DFR, and NRCO could potentially be used to develop a set of genomic or marker assistants.
- Clues obtained in GIS with the help of ISSR facilities cover a wide range of ornamental species which helps in effective site specific and species-specific surveys.
- Properties of rhizosphere microbial community structure and effects of engineered nanoparticles on rhizosphere and phyllosphere microorganisms.
- Commercialization of flowers through bioreactors covering micro release techniques to industry in network mode.

Management of Natural Resources

- Cost-effective agro-climatic management through optimization of a number of factors such as light, temperature, humidity, water, air, growing media and nutrition for quality flower production. Standardization of growing media using cheap and domestic materials such as leaf ferns, leaf molds, green moss, etc. can be explored.

- Development and popularization of cost-effective agricultural practices (INM/IPM) to increase productivity.
- Quantification of water use efficiency and water requirements of various commercial flowers based on growth habit.
- Carbon sequestration potential in orchid-based cropping systems

Post harvest and Value Addition

- Development of pre-harvest, harvest and post-harvest technologies of commercially cultivated flowers and specific hybrid/variety technologies for specific target groups such as domestic and export markets.
- Development of packaging for marketing of commercially important fresh and dry agricultural products using locally available materials.
- Development of decorative techniques for dried flowers and flower arrangements.
- Use of ornamental plant waste to produce photochemical products such as pigments, food, feed, herbal medicines, essential oils, etc.

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